



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,790	10/16/2003	Hirofumi Watatani	032015	7016
38834	7590	05/18/2005	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			CHEN, KIN CHAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

118
111

Office Action Summary	Application No. 10/685,790	Applicant(s) WATATANI, HIROFUMI	
	Examiner Kin-Chan Chen	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-15 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>101603</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in view of Liu et al (US 6,117,345; hereinafter "Liu").

In a method for semiconductor device fabrication, the admitted prior art (page 3 of the specification; Fig. 4B) teaches that an interlayer insulating film may be formed on a surface of a substrate having an insulating surface, formed with semiconductor elements, and having a conductive member exposed in a area of the insulating surface. A first antireflection film may be formed on a surface of an underlying substrate. The first antireflection film may suppression reflection in an absorption mode. A second antireflection film may be formed on the first antireflection film. The second antireflection film may suppress reflection in a countervailing interference mode. A photosensitive resist film may be formed thereon. A latent image may be formed in the photosensitive resist film by exposing the photosensitive resist film to light having a first wavelength. The exposed photosensitive resist film may be

developed to form an opening through the first photosensitive resist. The interlayer insulating film may be etched by using the first photosensitive resist film as a mask.

Unlike the claimed invention, the admitted prior art does not teach a cap film may be formed on the second antireflection film. In the method for forming wiring structure, Liu teaches that a cap layer may be formed over an antireflection layer (so-called protective layer in Liu) for the purpose of absorbing the light, col. 7, lines 11-16, 19-21, and 64-65. The cap layer may serve as a hardmask as well as a second antireflection layer which created destructive interference to prevent light from reflecting (col. 7, lines 58-67). The cap layer may be used to reduce the contamination when the photoresist is removed (col. 8, lines 33-47). Hence, it would have been obvious to one with ordinary skill in the art to use the cap layer as disclosed by Liu in the process of admitted prior art because Liu teaches that to do so would reduce the contamination when the photoresist is removed.

Dependent claims 2-5 and 7-10 differ from the combined prior art by specifying various attenuation coefficients of cap film, first antireflection film, and second antireflection film. However, since the combined prior art has the same functions and serves same purposes (such as reducing the contamination while removing the photoresist, suppression reflection in an absorption mode, suppression reflection in an interference mode), it would have been obvious to one with ordinary skill in the art to adjust various attenuation coefficients of cap film, first antireflection film, and second film because same are merely a matter of choices of design depending on the specific product requirements.

Allowable Subject Matter

3. Claims 11-15 are allowed.

The following is an examiner's statement of reasons for allowance:

The references of record do not teach or suggest a method comprising:


Removing the first photosensitive resist film; forming a second photosensitive resist film on the cap film; forming an opening through the second photosensitive resist, the opening corresponding to the wiring pattern to be formed on the interlayer insulating film, etching the interlayer insulating film to form a wiring groove by using the second photosensitive resist film as a mask.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

Art Unit: 1765

have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 12, 2005



Kin-Chan Chen
Primary Examiner
Art Unit 1765